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Re-evaluation Decision

Diuron

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Table of Contents

Re-evaluation Decision 1

What Does Health Canada Consider When Making a Re-evaluation Decision? 1

What is Diuron? 2

Health Considerations 2

Environmental Considerations 3

Measures to Minimize Risk 4

What Additional Scientific Information is Being Requested? 4

Other Information 5

List of Abbreviations 7

Appendix I Comments and Responses 9

Appendix II Diuron Current Canadian Registered Products as of 31 May 2007 13

Appendix III Label Amendments for Products Containing Diuron 15

Re-evaluation Decision

After a re-evaluation of the herbicide diuron, Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act*, is granting continued registration for the sale and use in Canada of products containing diuron.

An evaluation of available scientific information found that, products containing diuron do not present unacceptable risks to human health or the environment when used according to label directions. As a condition of the continued registration of diuron uses, new risk reduction measures must be included on the labels of diuron products.

The regulatory approach for the re-evaluation of diuron was first proposed in the consultation document[1] *Proposed Acceptability for Continued Registration of Diuron* (PACR2006-07). This Re-evaluation Decision document[2] describes this stage of the PMRA's regulatory process for the re-evaluation of diuron and summarizes the Agency's decision, the reasons for it and, in Appendix I, provides a summary of comments received during the consultation process and the PMRA's response to these comments. This decision is consistent with the proposed re-evaluation decision stated in the PACR for diuron (PACR2006-07). To comply with this decision, registrants of diuron products will be informed of the specific requirements affecting their product registration(s) and of regulatory options available to them.

What Does Health Canada Consider When Making a Re-evaluation Decision?

The PMRA is re-evaluating older active ingredients and their uses to determine their continuing acceptability in relation to human health, environment and value. Diuron is one of the active ingredients to be re-evaluated during the current re-evaluation cycle. Regulatory Directive DIR2001-03, *PMRA Re-evaluation Program*, presents the details of the re-evaluation activities and program structure.

Diuron has been re-evaluated under Re-evaluation Program 1, which relies as much as possible on foreign reviews, typically, United States Environmental Protection Agency (USEPA) Reregistration Eligibility Decision (RED) documents. For products to be re-evaluated under Program 1, there must exist a suitable foreign review that meets the following conditions:

- it covers the main science areas, such as human health and the environment, that are necessary for Canadian regulatory decisions;
- it addresses the active ingredient and the main formulation types registered in Canada; and
- it is relevant to registered Canadian uses.

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1 "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act* (http://laws.justice.gc.ca/en/P-9.01/92455.html)

2 "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act* (http://laws.justice.gc.ca/en/P-9.01/92455.html)

Based on the outcome of foreign reviews, the PMRA is taking, under Program 1, a regulatory decision and is requiring appropriate risk reduction measures for Canadian uses of an active ingredient. In this decision, the PMRA takes into account Canadian use patterns and issues (e.g. the federal Toxic Substances Management Policy [TSMP]). A review of the chemistry of Canadian products is also conducted.

The USEPA conducted a re-evaluation of diuron and published its conclusions in a 2003 RED. On the basis of health and environmental risk assessments, the USEPA concluded that diuron was eligible for reregistration with the implementation of risk reduction measures. Based on a comparison of American and Canadian use patterns, the USEPA assessments described in the 2003 RED were considered an adequate basis for this Canadian re-evaluation decision.

What is Diuron?

Diuron is a herbicide used to control weeds on food crops (grapes and asparagus) and non-cropland areas (including industrial sites and irrigation/drainage ditches) as well as to control algae in ponds and dugouts. Appendix II lists all diuron products that are registered under the authority of the *Pest Control Products Act*.

Health Considerations

Can Approved Uses of Diuron Affect Human Health?

Additional risk reduction measures are required on diuron labels. Diuron is unlikely to affect your health when used according to revised label directions.

Exposure to diuron may occur through diet (food and water), working as a mixer/loader/handler or by entering treated sites. When assessing health risks, two key factors are considered: the levels where no health effects occur, and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive exposed human population (e.g. children and nursing mothers). Only those uses where exposure is well below levels that cause no effects in animal testing are considered acceptable for continued registration.

The USEPA concluded that diuron was unlikely to affect human health provided that risk reduction measures were implemented. These conclusions were considered applicable to the Canadian situation and equivalent risk reduction measures are required.

Maximum Residue Limits

The *Food and Drugs Act (FDA)* prohibits the sale of adulterated food, that is, food containing a pesticide residue that exceeds the established maximum residue limit (MRL). Pesticide MRLs are established for FDA purposes through the evaluation of scientific data under the *Pest Control Products Act.* Each MRL value defines the maximum concentration in parts per million (ppm) of a pesticide allowed in/on certain foods. Food containing a pesticide residue that does not exceed the established MRL does not pose an unacceptable health risk.

Diuron is currently registered in Canada for use on grapes and asparagus. As noted, diuron may be used in other countries on other crops imported into Canada. MRLs for diuron are established for the following commodities: asparagus, citrus fruits, corn, grapes, pineapple, potatoes and wheat. Where no specific MRL has been established, a default MRL of 0.1 ppm applies, which means that pesticide residues in a food commodity must not exceed 0.1 ppm. However, changes to this general MRL may be implemented in future, as indicated in Discussion Document DIS2006-01, *Revocation of the 0.1 ppm as a General Maximum Residue Limit for Food Pesticide Residues [Regulation B.15.002(1)]*. If and when the general MRL is revoked, a transition strategy will be established to allow permanent MRLs to be promulgated.

Environmental Considerations

What Happens When Diuron is Introduced Into the Environment?

Additional risk reduction measures are required on product labels containing diuron. Diuron is unlikely to affect non-target organisms when used according to revised label directions.

Non-target organisms (e.g. birds, mammals, insects, aquatic organisms and terrestrial plants) may be exposed to diuron in the environment. Environmental risk is assessed by the risk quotient method, in which a risk quotient (RQ) is calculated as the ratio of the estimated environmental concentration (EEC) to the relevant effects endpoint of concern. The resulting RQs are compared to corresponding levels of concern (LOCs). An RQ less than the LOC is considered as a low risk to non-target organisms, whereas, an RQ greater than the LOC indicates some degree of risk.

The USEPA concluded that reregistration of diuron was acceptable provided risk reduction measures to further protect the environment were implemented. These conclusions were considered applicable to the Canadian situation and equivalent risk reduction measures are required.

Measures to Minimize Risk

Registered pesticide product labels contain specific directions for use which include risk reduction measures to protect human and environmental health. These directions must be followed by law. As a result of the re-evaluation of diuron, further risk reduction measures are required in addition to those already identified on existing diuron product labels. These additional measures are summarized as follows:

Human Health

- To protect handlers: the wettable powder formulation must be discontinued and additional protective equipment is required
- To protect workers re-entering treated sites: restricted entry intervals

Environment

- To reduce potential spray drift and runoff: additional advisory label statements
- To protect non-target sensitive aquatic and terrestrial plants: buffer zones for aquatic and terrestrial habitats

Appendix III lists all required label amendments.

What Additional Scientific Information is Being Requested?

Data Required as Condition for Continued Registration (Section 12)

The following data are required as a condition of continued registration under Section 12 of the PCPA. The registrants of this active ingredient are required to provide these data or an acceptable scientific rationale within the time specified in the decision letter that will be sent to registrants of the technical active ingredients.

- Data to confirm that acceptable levels of diuron, its metabolites convertible to 3,4-dichloroaniline and N'-(3-chlorophenyl)-N,N-dimethyl urea (MCPDMU) are not exceeded in ground water in Canada are required. A scientific rationale to show relevance of existing American ground and surface water monitoring data to Canada may be acceptable. This rationale should include information on diuron use in Canada (e.g. areas of use, quantity used, typical application rates, etc.) and establish the vulnerability of areas of use to groundwater contamination (i.e. provide information on soil type and groundwater depth in areas of use). Any existing Canadian water monitoring data are also required.

Other Information

Any person may file a notice of objection[3] regarding this decision on diuron within 60 days from the date of publication of this Re-evaluation Decision document. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the PMRA's website (Requesting a Reconsideration of Decision, www.pmra-arla.gc.ca/english/pubreg/reconsideration-e.html), or contact the PMRA's Pest Management Information Service by phone (1-800-267-3615) or by e-mail (pmra_infoserv@hc-sc.gc.ca).

[3] As per subsection 35(1) of the *Pest Control Products Act* (http://laws.justice.gc.ca/en/P-9.01/92455.html)

List of Abbreviations

µg	microgram
ASAE	American Society of Agricultural Engineers
a.i.	active ingredient
cm	centimeter
DT_{50}	time required for 50% dissipation
DWLOC	drinking water level of concern
EEC	estimated environmental concentration
EC_{50}	effect concentration 50%
ha	hectare
kg	kilogram
L	litre
LC_{50}	mean lethal concentration
LD_{50}	mean lethal dose
LOAEL	lowest observed adverse effect level
LOC	levels of concern
m	metre
M/L/A	mixer/loader/applicator
MOE	margin of exposure
MRL	maximum residue limit
N/A	not applicable
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
PACR	Proposed Acceptability for Continuing Registration
PCPA	*Pest Control Products Act*
ppm	parts per million
PMRA	Pest Management Regulatory Agency
RED	Reregistration Eligibility Decision
REI	restricted-entry interval
RQ	risk quotient
TSMP	Toxic Substances Management Policy
USEPA	United States Environmental Protection Agency

Appendix I Comments and Responses

Comments and responses to PACR 2006-07

1. **Comment on the Maximum Application Rates for Non-crop areas**:

Application rates for non-crop/rights of way were revised in the RED to a maximum of 13.5 kg a.i. /ha per year and a maximum single application of 9 kg a.i./ha except areas of high rainfall or dense vegetation where a maximum single application of 13.5 kg a.i./ha was permitted. To achieve optimum herbicide activity, the registrant is requesting a maximum single application per year of 13.5 kg a.i./ha for diuron products applied to industrial/non-crop areas with high rainfall or dense vegetation, based on the recommendations in the USEPA RED.

PMRA:

For non-crop areas, the newly proposed single application rate of 13.5 kg a.i./ha is taken into consideration in the re-calculation of the buffer zones.

2. **Comment on Terrestrial Buffer Zone Exemption**:

The registrant is requesting non-crop use of diuron on rights-of-way and industrial sites (including military bases), be exempt from terrestrial buffer zones as it would not be practically feasible to implement 75-110 m buffer zones in these areas.

PMRA:

The PMRA has exempted rights-of way uses from requiring terrestrial buffer zones because complete plant/weed control is required right up to edge of the application areas on these sites in order to ensure user's safety. Because rights-of-way are relatively narrow passages, often in densely vegetated, hard to access areas, terrestrial buffer zone requirements (especially for herbicides) would often be greatly reduced as applicators will have access to alternative control strategies, such as spot applications, mechanical or alternative chemical controls, use fo spray reduction technologies (as indicated in the PMRA's revised buffer zone table - see comment 4 below), or the ability to apply the product when the wind is not blowing towards the sensitive habitat.

3. Comment on Aquatic Buffer Zone Calculations – Endpoints:

The registrant is requesting that an aquatic toxicity study that was submitted to satisfy the non-target aquatic plant requirement in the US be reviewed by the PMRA to determine an appropriate endpoint (NOEC) from which aquatic buffer zones may be calculated.

PMRA:

For assessing the risk to aquatic plants and invertebrates, the PMRA currently applies an uncertainty factor of two to the EC_{50}/LC_{50} endpoint. In this case, the EC_{50} for *Selenastrum capricornutum* was determined by the USEPA to be 2.4 µg a.i./L, thus, the risk endpoint is: 2.4 ÷ 2 = 1.2 µg a.i./L. Using this endpoint, the PMRA recalculated the buffer zones as:

Method of Application	Use	Buffer Zones (m) Required for Aquatic Habitats at Water Depths of:	
		<1 m	>1 m
Field Sprayer	Asparagus (medium spray)	15	5
	Grapes (medium spray)	15	10
	Non-crop areas (coarse spray)	15	10

Note: the PMRA has revised the requirements for aquatic-habitat buffer zones which are now based on two water depths, <1 m and >1 m. In this case, the buffer zones were calculated using 0.80 m and 2.0 m deep ponds which corresponds to the <1 m and >1 m water depths, respectively.

4. Comment on Buffer Zone Calculations – Spray quality:

The registrant has indicated that the typical use scenario for diuron applied to non-crop areas consists of a vehicle mounted sprayer (boom sprayer or Radiarc® Sprayer) or high volume spray gun. The combination of high water volume, large flow rate nozzles and low pressures produces coarse to extremely coarse sprays, minimizing drift potential. Based on the typical application scenario of diuron for non-crop weed control, the registrant has requested buffer zones be recalculated utilizing the "coarse" spray designation as this accurately reflects typical usage.

PMRA:

On the basis of the spray quality of "coarse" for non-crop areas, the aquatic endpoint (1.2 µg a.i./L) indicated in comment 3 above, and the exemptions for terrestrial habitat protection, the buffer zones required for diuron are as follows:

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		<1 m	>1 m	
Field Sprayer*	Asparagus (medium spray)	15	5	40
	Grapes (medium spray)	15	10	55
	Non-crop areas (coarse spray)	15	10	60**

* For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

** Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

Thus, include the following on the diuron product label:

Add to **ENVIRONMENTAL HAZARDS:**

TOXIC to aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

Add to **DIRECTIONS FOR USE:**

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) classification indicated in the table under "Buffer zones".

DO NOT apply by air.

For application to rights-of-way (including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases), buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies which minimize off-site drift, including meteorological conditions

3. **Comment on Aquatic Buffer Zone Calculations – Endpoints:**

The registrant is requesting that an aquatic toxicity study that was submitted to satisfy the non-target aquatic plant requirement in the US be reviewed by the PMRA to determine an appropriate endpoint (NOEC) from which aquatic buffer zones may be calculated.

PMRA:

For assessing the risk to aquatic plants and invertebrates, the PMRA currently applies an uncertainty factor of two to the EC_{50}/LC_{50} endpoint. In this case, the EC_{50} for *Selenastrum capricornutum* was determined by the USEPA to be 2.4 µg a.i./L, thus, the risk endpoint is: 2.4 ÷ 2 = 1.2 µg a.i./L. Using this endpoint, the PMRA recalculated the buffer zones as:

Method of Application	Use	Buffer Zones (m) Required for Aquatic Habitats at Water Depths of:	
		<1 m	>1 m
Field Sprayer	Asparagus (medium spray)	15	5
	Grapes (medium spray)	15	10
	Non-crop areas (coarse spray)	15	10

Note: the PMRA has revised the requirements for aquatic-habitat buffer zones which are now based on two water depths, <1 m and >1 m. In this case, the buffer zones were calculated using 0.80 m and 2.0 m deep ponds which corresponds to the <1 m and >1 m water depths, respectively.

4. **Comment on Buffer Zone Calculations – Spray quality:**

The registrant has indicated that the typical use scenario for diuron applied to non-crop areas consists of a vehicle mounted sprayer (boom sprayer or Radiare® Sprayer) or high volume spray gun. The combination of high water volume, large flow rate nozzles and low pressures produces coarse to extremely coarse sprays, minimizing drift potential. Based on the typical application scenario of diuron for non-crop weed control, the registrant has requested buffer zones be recalculated utilizing the "coarse" spray designation as this accurately reflects typical usage.

PMRA:

On the basis of the spray quality of "coarse" for non-crop areas, the aquatic endpoint (1.2 µg a.i./L) indicated in comment 3 above, and the exemptions for terrestrial habitat protection, the buffer zones required for diuron are as follows:

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		<1 m	>1 m	
Field Sprayer*	Asparagus (medium spray)	15	5	40
	Grapes (medium spray)	15	10	55
	Non-crop areas (coarse spray)	15	10	60**

* For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

** Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

Thus, include the following on the diuron product label:

Add to **ENVIRONMENTAL HAZARDS:**

TOXIC to aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

Add to **DIRECTIONS FOR USE:**

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) classification indicated in the table under "Buffer zones".

DO NOT apply by air.

For application to rights-of-way (including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases), buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies which minimize off-site drift, including meteorological conditions

(e.g. wind direction, low wind speed) and spray equipment (e.g. coarse droplet sizes, minimizing height above canopy), should be used. Applicators must, however, observe the specified buffer zones for protection of sensitive aquatic habitats.

Buffer zones:

Buffer zones are not required for applications with hand-held sprayers if the spraying height is 60 cm or less above the weed canopy.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, rangelands, riparian areas and shrublands), sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) and estuarine/marine habitats.

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		Less than 1 m	Greater than 1 m	
Field Sprayer[a]	Asparagus (medium spray)[b]	15	5	40
	Grapes (medium spray)[b]	15	10	55
	Non-crop areas (coarse spray)[c]	15	10	60[d]

[a] For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

[b] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification.

[c] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification.

[d] Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

When a tank mixture is used, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture.

Appendix II Diuron Current Canadian Registered Products as of 31 May 2007

Registrant	Registration Number	Guarantee	Product name	Formulation Type	Class
Makhteshim-Agan of North America Inc.	14135	80.0%	Diurex 80W Herbicide Wettable powder	Wettable Powder	Commercial + Restricted
E.I. Dupont Canada Inc.	21071	98.4%	Diuron Technical Herbicide	Solid	Technical
E.I. Dupont Canada Inc..	21252	80.0%	Karmex XP Herbicide	Wettable granules	Commercial + Restricted
E.I. Dupont Canada Inc.	22964	40% + 40% Bromacil	Krovar 1DF Herbicide	Wettable granules	Commercial + Restricted
Dow AgroSciences Canada Inc.	26949	80.0%	Diuron 80DF herbicide	Wettable granules	Commercial + Restricted
Makhteshim-Agan of North America Inc.	27567	98.5%	Diurex Technical Herbcide	Solid	Technical
Makhteshim-Agan of North America Inc.	28107	80.0%	Diurex 80 WDG	Wettable granules	Commercial + Restricted
E.I. Dupont Canada Inc.	28543	80.0%	Karmex DF Herbicide	Wettable granules	Commercial + Restricted

(e.g. wind direction, low wind speed) and spray equipment (e.g. coarse droplet sizes, minimizing height above canopy), should be used. Applicators must, however, observe the specified buffer zones for protection of sensitive aquatic habitats.

Buffer zones:

Buffer zones are not required for applications with hand-held sprayers if the spraying height is 60 cm or less above the weed canopy.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, rangelands, riparian areas and shrublands), sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) and estuarine/marine habitats.

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		Less than 1 m	Greater than 1 m	
Field Sprayer[1]	Asparagus (medium spray)[2]	15	5	40
	Grapes (medium spray)[2]	15	10	55
	Non-crop areas (coarse spray)[3]	15	10	60[4]

[1] For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

[2] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification.

[3] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification.

[4] Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

When a tank mixture is used, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture.

Appendix II Diuron Current Canadian Registered Products as of 31 May 2007

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E.I. Dupont Canada Inc.	21071	98.4%	Diuron Technical Herbicide	Solid	Technical
E.I. Dupont Canada Inc.	21252	80.0%	Karmex XP Herbicide	Wettable granules	Commercial + Restricted
E.I. Dupont Canada Inc.	22964	40% + 40% Bromacil	Krovar 1DF Herbicide	Wettable granules	Commercial + Restricted
Dow AgroSciences Canada Inc.	26949	80.0%	Diuron 80DF herbicide	Wettable granules	Commercial + Restricted
Makhteshim-Agan of North America Inc.	27567	98.5%	Diurex Technical Herbicide	Solid	Technical
Makhteshim-Agan of North America Inc.	28107	80.0%	Diurex 80 WDG	Wettable granules	Commercial + Restricted
E.I. Dupont Canada Inc.	28543	80.0%	Karmex DF Herbicide	Wettable granules	Commercial + Restricted

Appendix III Label Amendments for Products Containing Diuron

End-use products formulated as a wettable powder must be phased out.

The Canadian registrants for the technical grade active ingredients have indicated that the use of diuron on ponds and dugouts will no longer be supported in Canada and will be phased out. These uses must be removed from end-use product labels.

Canadian end-use product labels must be amended to include the following to further protect human health and the environment.

- The maximum application rates for uses of diuron on industrial sites and non-crop uses including irrigation and drainage ditches must be reduced to the following:
  - a maximum of 9 kg a.i./ha per application (including spot treatment);
  - a maximum of 2 applications (including spot treatment) per year;
  - a maximum of 13.5 kg a.i./ha (including spot treatment) per year; and
  - a single maximum application of 13.5 kg a.i./ha for sites receiving high rainfall and covered in dense vegetation.

- The **PRECAUTIONS** section of all end-use product labels must include the following statements:

  - "Wear long pants, a long-sleeved shirt, shoes plus socks, chemical-resistant gloves and a dust/mist respirator during mixing, loading, application, clean-up and repair activities. In addition, wear a chemical-resistant apron during mixing, loading, clean-up and repair activities. If applying from inside a closed cab, applicators must wear long pants, a long-sleeved shirt and shoes plus socks. When exiting the cab into the treated area, in addition to this protective equipment, applicators must wear chemical-resistant gloves and a dust/mist respirator. This protective clothing must be taken off before re-entering the cab and stored in a chemical-resistant container to prevent contamination of the inside of the cab."

  - "Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours or until sprays have dried."

  - "Do not apply this product in a way that will cause this product to contact workers or other persons, either directly or through drift. Only handlers (mixers, loaders and applicators) wearing personal protective equipment may be in the area being treated during application."

  - "Users should wash their hands before eating, drinking, chewing gum, using tobacco or using the toilet."

- "Users should remove clothing immediately if pesticide comes in contact with skin through soaked clothing or spills. Then wash skin thoroughly and put on clean clothing."

- "Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them."

- The **DIRECTIONS FOR USE** section of all end-use product labels must include the following statements:

  - Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) classification indicated in the table under "Buffer zones".

  - **"DO NOT** apply by air".

  - "For application to rights-of-way, the best available application strategies which minimize off-site drift, including meteorological conditions (e.g. wind direction, low wind speed) and spray equipment (e.g. coarse droplet sizes, minimizing height above canopy), should be used. Do not directly apply to any aquatic habitats that are traversed by the rights-of-way."

  - "Buffer zones: The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, pastures, rangelands and shrublands), sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) and estuarine/marine habitats.

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		Less than 1 m	Greater than 1 m	
Field Sprayer[a]	Asparagus (medium spray)[b]	15	5	40
	Grapes (medium spray)[b]	15	10	55
	Non-crop areas (coarse spray)[c]	15	10	60[d]

[a] For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

[b] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification.

[c] DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification.

[d] Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

- If tank mixes are included on the label, the **DIRECTIONS FOR USE** section must include the following statement:
  - "When a tank mixture is used, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture."
- The following statement must appear in the **DIRECTIONS FOR USE** section of the label for all uses except asparagus.
  - "When a second application is performed, observe a minimum interval of 90 days between the first application and retreatment."
- The following statements must appear in the **DIRECTIONS FOR USE** section of the label of products registered for use on non-crop areas.
  - "Do not use in residential areas or areas where bystanders may be in contact with treated foliage."
  - "Residential areas are defined as sites where bystanders including children may be potentially exposed during or after spraying. This includes around homes, school, parks, playgrounds, playing fields, public buildings."

Method of Application	Use	Buffer Zones (m) Required for Protection of:		
		Aquatic Habitats at Water Depths of:		Terrestrial Habitats
		Less than 1 m	Greater than 1 m	
Field Sprayer[2]	Asparagus (medium spray)[3]	15	5	40
	Grapes (medium spray)[3]	15	10	55
	Non-crop areas (coarse spray)[4]	15	10	60[5]

2 For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy or ground, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy or ground, the labelled buffer zone can be reduced by 30%.

3 DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification.

4 DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification.

5 Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.

- If tank mixes are included on the label, the **DIRECTIONS FOR USE** section must include the following statement:
  - "When a tank mixture is used, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture."
- The following statement must appear in the **DIRECTIONS FOR USE** section of the label for all uses except asparagus.
  - "When a second application is performed, observe a minimum interval of 90 days between the first application and retreatment."
- The following statements must appear in the **DIRECTIONS FOR USE** section of the label of products registered for use on non-crop areas.
  - "Do not use in residential areas or areas where bystanders may be in contact with treated foliage."
  - "Residential areas are defined as sites where bystanders including children may be potentially exposed during or after spraying. This includes around homes, school, parks, playgrounds, playing fields, public buildings."

- "Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools and parks is minimal. Take into consideration meteorological conditions (e.g. wind speed, wind direction, temperature) as well as application equipment and sprayer settings used for application."

- The directions for use on irrigation/drainage ditches must be enclosed in a dark heavy line, i.e. boxed in, and must include the following statements.

  - "Restricted Uses—Irrigation and drainage ditches."

  - "NOTICE TO USER: This control product is to be used only in accordance with the directions on this label. It is an offense under the *Pest Control Products Act* to use a control product under unsafe conditions."

  - "NATURE OF RESTRICTION: This product is to be used only in the manner authorized; consult provincial pesticide regulatory authorities about use permits that may be required."

  - "NOTE: The use of [*product name*] requires authorization by Provincial Permit. Provincial permits must include specifications of measures:

    a) To prevent treated water that contains diuron from endangering fish in natural bodies of water and reservoirs used as commercial and recreational fisheries.
    b) To prevent the release of treated water into dugouts used for domestic and livestock water supplies.
    c) To notify downstream users of irrigation water and the public."

- An **ENVIRONMENTAL HAZARD** section must appear on the end-use product labels and must include the following statements.

  - "TOXIC to aquatic organisms and terrestrial plants. Observe buffer zones specified under **DIRECTIONS FOR USE**."

  - "Toxic to aquatic organisms. Do not apply directly to aquatic habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs or wetlands) and estuarine/marine habitats. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes."

- "To reduce runoff from treated areas into aquatic habitats, consider the characteristics and conditions of the site before treatment. Site characteristics and conditions that may lead to runoff include, but are not limited to, heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g. soils that are compacted, fine textured or low in organic matter such as clay)."

- Avoid application of this product when heavy rain is forecast."

- "The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sandy soil) and/or where the depth to the water table is shallow."

The label amendments presented above do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements, and supplementary protective equipment. Additional information on labels of currently registered products should not be removed unless it contradicts the above label statements.

A submission to request label revisions is required within 90 days of this re-evaluation decision.